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ABSTRACT

The use of prompting to increase peer-tutoring skills in an entire third grade classroom was investigated. A multiple baseline design was used in establishing three tutoring components: praise corrective feedback, and re-presenting the question. Results indicated that all three tutoring behaviors increased after prompting. During the last experimental phase, when program youngsters were not being prompted, high levels of peer-tutoring behaviors were maintained. When program children were compared to control youngsters, the children involved in the intervention earned significantly higher postpoint grades in spelling, mathematics, and reading. (Author)

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Increasing Peer-Tutoring Behaviors in a Third Grade Classroom

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Increasing Peer-Tutoring Behaviors in a Third Grade Classroom

Cross-age and peer tutoring projects represent unique opportunities for creating behavior settings which enable children to help and teach each other basic competencies. Cross-age tutoring projects involve older children tutoring younger students. The majority of these types of interventions have succeeded in improving functioning in target tutees with identified academic lags or behavioral difficulties (Cloward, 1967; Dreyer, 1973; Frager & Stern, 1970; Johnson & Bailey, 1974; Robertson, DeReus, & Drabman, 1976; Schwartz, 1977). Unfortunately, these projects have rarely been extended to entire classrooms of normal functioning students.

In peer-tutoring projects, children in the same grade level tutor each other. Hamblin and Hamblin (1972) found that a peer-tutoring intervention was more effective than a cross-age tutoring project. In another comparative intervention, Coyne (1978) found greater improvements on exams for those provided peer tutors as opposed to those who studied independently. In still another study, Oakland and Williams (1975) found that third and fourth graders who received peer-tutoring as a supplement to teacher instruction learned more than children who received all their instruction through peer tutoring. Harris and Sherman's (1973) innovative project involved an entire class of fourth graders in a peer-tutoring experience. In their intervention, the percent of math problems children completed correctly was highest when a math period was preceded by peer-tutoring. These studies suggest that peer-tutoring can be applied to entire classrooms, might be more effective than cross-age tutoring or independent studying, and possibly is best

utilized as a supplement to teacher instruction.

In establishing teaching skills, most of the above interventions have employed a package of behavioral techniques, including modeling, behavioral rehearsal, corrective feedback, prompting, and praise. In addition, these studies established all tutoring behaviors simultaneously. In contrast, a recent study by Jason, Ferone, and Soucy (1979) attempted to establish systematically three tutoring behaviors (i.e., corrective feedback, re-presenting questions, and contingent praise) using a multiple baseline design. Prompting was shown to effectively increase the tutoring behaviors among students in two entire elementary school classrooms. In a latter study, Jason and Frasure (Note 1) replicated the above findings in a first grade classroom and found significant second-order salutary changes in academic as well as school adjustment indices.

The present study attempted to systematically establish peer-tutoring behaviors in an entire class of normal third graders. Two reversal phases were added to the basic experimental design (i.e., multiple baseline) to assess maintenance of tutoring behaviors following termination of prompting. The effect of the intervention on academic, classroom adjustment, as well as self-esteem measures, was evaluated.

Method

Site and Subject Selection

Children involved in the peer-tutoring project (Es) were 19 third graders in an inner-city, parochial, elementary school. The 23 third grade youngsters from the control classroom (Cs) were enrolled in another parochial school in the same geographic area. There were no significant age differences between the E and C children ($t(40) = .22$). There were 8 males and 11 females

in the E classroom, and 7 males and 16 females in the C group (employing a chi-square, there were no significant sex differences, $x^2(1) = .21$). Significant ~~social~~ racial differences between the groups were found ($x^2(2) = 18.68$, $p < .01$). In the program classroom, there were 4 Blacks, 8 Caucasians, and 7 Latinos; in the control class, there were 20 Blacks, 1 Caucasian, and 2 Latinos.

Program

In the actual program, the third graders assumed three roles: tutor, tutee, and scorekeeper. The children, working in groups of three, rotated roles every five minutes. There were 5 triads and one group of four (in this latter group, two children assumed the role of scorekeeper). A fifteen minute free play period followed the fifteen minute peer tutoring program. On alternate sessions, children were tutored in arithmetic and word recognition (the material was obtained from lessons the teacher was currently introducing and working on in her classroom).

Prior to the first session with the third grade children, a role play of a correct and incorrect response was demonstrated. A university observer in each group told the children: "We're going to play the teaching game. Watch how this is done. I'm the teacher and _____ (another observer) is the student. I lift this card and say: 'What is this?' (Answer is said.) And then I say: 'That's right.' Now if the student says the wrong answer, this is what I do (the first card is put down, the second is held up): 'What is this?' (Wrong answer is said.) 'This is a _____. What is it?' (Correct answer is said.) 'That's right.'"

On the first day, the scorekeeping system was described. The observer pointed to one of the children and said, "You are going to be the scorekeeper."

The Child Recording Form was then placed in front of the child. The observer said, "There are 30 spaces for answers. If the right answer is given, write a plus in the first line. O.K. Watch. 'What is this?' (Observer says right answer.) 'Right.' So I put a plus right here. Now if the wrong answer is given, write a dash. Watch and we'll do it. 'What is this?' (Wrong answer is given.) 'This is a _____. What is this?' (Right answer is given.) 'Great.' Now I put a dash (-) here because the wrong answer was given first."

When the teaching game was finished, each child was praised by the observer and given feedback about how many of the 30 trials were correct. When the children achieved $\geq$ 90% accuracy for that unit, the entire class moved on to the next section. Children received a happygram after each session with the number of correct responses written on it. For good conduct, program children received a small star which was placed on a happygram.

Experimental Design

A multiple baseline reversal design was employed.

Baseline. Prior to the first session, all children observed a role-play of the tutoring game (as described above). During sessions 1-4, children were asked to play the teaching game.

Prompting Praise. University students prompted praise during sessions 5-16. Following a correct response, if the tutor did not praise spontaneously, the prompter asked the tutor to praise the tutee.

Prompting Feedback. During sessions 9-16, the observer prompted corrective feedback. If a tutor did not spontaneously offer the correct answer following an incorrect response, the university student told the tutor: "Tell the students this is a _____." Praise was also prompted during this phase.

Prompting Re-presenting the Question. Re-presenting questions were prompted during sessions 13-16. After the tutor corrected an incorrect tutee response, and failed to spontaneously re-present the question, the observer said: "Ask _____ (the tutee), 'What is this?'" Praise and feedback were also prompted during this phase.

Baseline. For the next six sessions (17-22), the university observers did not prompt the students.

Prompting. Prompting for all 3 tutoring behaviors occurred during sessions 23-28.

Baseline. During sessions 29-33, baseline conditions were re-established.

Reliability. While each group of children had one university observer assigned to it, five extra university observers were rotated to different peer-tutoring groups in order to gather 149 interrater reliability estimates.

Measures

Continuous in-process interactional measures were gathered. In addition, pre-post criterion measures assessed children's classroom behaviors, grades, academic achievement, and self-esteem. Consumer satisfaction ratings were also obtained.

Observational Indices

The Observer Recording Form was used to record tutoring and prompting behaviors. If the child tutee correctly responded to the card, a check was inserted in the answer column; a minus signified an incorrect response on the first trial. If the child tutor correctly used the three prompts, correct feedback, repeat question, and praise, checks were placed in these columns. If prompts were not used correctly, minuses were placed in these columns. Correct feedback referred to the tutor's provision of the correct answer following a tutee's incorrect response. Repeating the question referred to

to re-presenting the question ("What is this?") following a wrong tutee answer and a tutor's provision of the correct answer. Praise was defined as a positive verbal comment (e.g., that's correct, right, terrific, great, etc.).

Academic Indices

Prior to the start of the program and at the end of the intervention, the Wide Range Achievement Test (Jastak & Jastak, 1965) was individually administered. Scores were obtained in reading, writing and arithmetic. Split-half correlation coefficients for the subtests vary from .90 to .95. Pre-and post-testers were not familiar with the intervention. In addition, pre-post changes in children's grades in arithmetic, spelling, writing and conduct were monitored. Both teachers used the following grading scale: 1 = below average; 2 = average; 3 = above average; and 4 = superior.

Teacher Perceptions

Teachers filled out the Classroom Adjustment Rating Scale (CARS) (Lorion, Cowen & Caldwell, 1975) on each child at the start and end of the project. This instrument has forty-one, 5-point behaviorally oriented items. Higher scores indicate more serious problems. The questionnaire yields an overall index (T), which is the sum of the items. The three principal factors are acting-out, moodiness, and learning. Test-retest reliability for this instrument was .92. One section of the CARS includes a 7-point school adjustment scale (higher numbers indicating fewer school adjustment problems).

Self-Esteem

The Self-Esteem Inventory (Coopersmith, 1967) was administered to children at pre- and post-points. This instrument yields an overall score tapping children's self-esteem. The test-retest reliability for the instrument

was .88.

Consumer Satisfaction

A six item consumer satisfaction questionnaire, many of the items from Kent and O'Leary's (1976) scale, was administered to the E teacher at program end. Questions on this scale have five point scales, with higher numbers indicating higher satisfaction. The teacher rated the project's goals, and her feelings toward the project and the university helpers. In addition, at program end children in the treatment class were asked whether they liked or did not like the teaching game and whether they used the tutoring game during nonproject times.

Results

Reliability

Interrater agreement on the Observer Recording Form was conservatively defined as concordant ratings for an entire peer-tutoring episode. Agreement, therefore, occurred when observers similarly scored the following categories: tutee answer, corrective feedback, re-presenting the question, and use of praise. The average agreement among observers, calculated by agreements/(agreements plus disagreements) was 95%.

Tutoring Behaviors

Figure 1 presents the percent of the unprompted three tutoring behaviors

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Insert Figure 1 about here

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over time. Teaching behaviors increased after prompting for both the reading and arithmetic units. During the baseline period, the children used contingent praise 11% of the time when teaching reading and 10% of the time when teaching arithmetic. During the intervention, unprompted praise increased

to an average of 79% during reading units and to an average of 91% during arithmetic units. Reductions in praise were noted during the return to baseline phase, but high rates of praise were again attained during the last two phases.

Corrective feedback when teaching reading increased from a baseline average of 21% to an average of 64% after prompting. For arithmetic units, corrective feedback increased from a baseline average of 58% to 80% after prompting. During the return to baseline phase, feedback increased for reading but decreased slightly for arithmetic. With re-implementation of prompting, feedback increased for reading and decreased slightly for arithmetic. Increases were noted for both arithmetic and reading during the last phase.

Re-presenting questions showed averages of 2% for reading units and 7% for arithmetic units during baseline. After onset of intervention, re-presenting questions increased to 51% for reading units and 40% for arithmetic units. During the subsequent return to baseline phase decreases were noted, but with onset of prompting, rates of re-presenting the question increased dramatically. During the last phase, decreases were manifest during the reading units and increases during the arithmetic units.

Scorekeeping

Even though the third graders were never prompted for accuracy in scorekeeping, their average percent of correct scorekeeping was 96% (range from 85% to 100%).

Academic Materials

The third graders successfully mastered four units of spelling and six units of arithmetic.

Pre-Post Criterion Measures

Even though E children manifested increases on their Wide Range Achievement Test scores, when compared to Cs at postpoint, using an analysis of covariance, no significant differences were found for spelling, mathematics or reading.

In terms of postpoint grades, employing an analysis of covariance, E children, in comparison to Cs, earned significantly higher reading ($F(1,38) = 4.05$, $p < .05$), spelling ($F(1,38) = 8.61$, $p < .01$), and mathematics ($F(1,38) = 5.27$, $p < .05$) grades.

There were no significant E vs C postpoint differences, using an analysis of covariance, on the Classroom Adjustment Rating Scale or the Self-Esteem Inventory.

Consumer Satisfaction

All but 2 of the third graders indicated they liked the teaching game. Reasons for liking the game included, "It was fun because it helped me learn," "I liked it because it helped me spell more hard words," "...because I like the people and the words," and "It teached me a lot and they (university students) are nice." Ten of the third graders indicated they used the teaching game during nonproject times. During those times, they taught the game to their brothers, sisters, and friends. Two children indicated they taught the game to their mothers.

On 5-point scales, the teacher gave the university helpers ratings of 5, indicating that they were perceived at likeable, committed, and competent. In addition, highest ratings were also given to three items indicating the procedures used were very helpful, the teacher definitely wanted to continue employing this type of program in the future, and she would definitely

recommend participation in this program to others. On an additional comments section of the consumer satisfaction questionnaire, the teacher wrote, "This is an excellent program. I wish we would expand the program to the other grades."

Discussion

The study's principal finding was that an entire class of normal third graders could successfully learn three peer-tutoring behaviors. Using a multiple-baseline design, with onset of prompting, level increases were noted in the use of praise, feedback, and re-presenting the question. During the first withdrawal phase, decreases in most of the tutoring behaviors were noted. High levels of tutoring behaviors were documented, however, during the last two phases. These findings indicate that by intervention end, the program children were able to successfully peer-tutor without prompting by university students. In addition, the children's academic grades significantly improved, and the teacher and the children positively evaluated the intervention.

In a previous investigation, Jason, Ferone and Soucy (1979) did not assess whether tutoring behaviors were maintained during a withdrawal phase. The present study indicated erosion of tutoring skills during the first withdrawal, but generalization was achieved during the second withdrawal phase. Between the first and second withdrawal phases, the youngsters were provided six additional sessions where tutoring skills were prompted. This booster condition effectively enabled program children to tutor in the absence of prompting. Further research is needed to determine whether gains would be maintained during longer term follow-ups.

Children responded differentially to the arithmetic and reading units. Generally, higher levels of tutoring behaviors were manifested on days when

arithmetic cards were utilized. There are two reasons which account for these findings: (a) The answers to the arithmetic problems were on the back of the cards, thus facilitating use of corrective feedback; and (b) Whereas children knew or were provided with the answers to the arithmetic problems, sometimes the youngsters were not acquainted with the words in the reading unit. Corrective feedback could not be given if a child did not know how to pronounce a particular word. Future peer-tutoring programs might establish a behavior in tutors which would elicit correct pronounciations, answers, or other requisite information from the teacher or a classroom monitor.

The most striking differences between the program and nonprogram children at postpoint were that the Es received significantly higher grades. Even though the E children did evidence improvement in the Wide Range Achievement Test scores, there were no significant E versus C differences at the program end. The tutoring program which focused on reviewing math and reading units from the teacher's curriculum had a greater effect in children's performance on classroom material, as reflected in grades, than on achievement indices, as measured by the Wide Range Achievement Test. In regard to ancillary criterion measures, the peer-tutoring project did not effect significant changes in teacher's perceptions of children's behavior difficulties or indices of self-esteem.

There were several methodological difficulties encountered in the present study. The experimental and control classrooms were not matched on racial background. To avoid this problem in the future, classes of children within a school might be randomly divided into treatment and control conditions. A second problem concerned limited data points in experimental phases. For example, the first treatment phase in re-presenting the question should have

been extended until stability had been achieved. Finally, as stated previously, there is a need for longer-term follow-ups to assess maintenance of gains during the withdrawal condition.

This study demonstrated that specific components of the tutoring process can be taught to children. When prompting was introduced at different time points for the three tutoring behaviors, these behaviors increased over baseline levels. In addition, tutoring skills were maintained during the final return to baseline phase. While the majority of previous peer-tutoring investigations have focused exclusively on target children evidencing academic or behavioral problems, the present study established peer-tutoring competencies in an entire classroom of normal third graders. This primary prevention program utilized all the human resources of a classroom to inculcate positive prosocial behaviors. Behavioral investigators might profit from investing more time in enhancing capacities and competencies in normal functioning children and adults in order to increase resistance to maldevelopment and attain higher levels of mental health functioning (Glenwick & Jason, in press).

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1. Jason, L. A. & Frasure, S. Establishing supervising behaviors in eighth graders and peer-tutoring behaviors in first graders. Paper presented at the meeting of the Midwestern Psychological Association, Chicago, May, 1979.

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Footnotes

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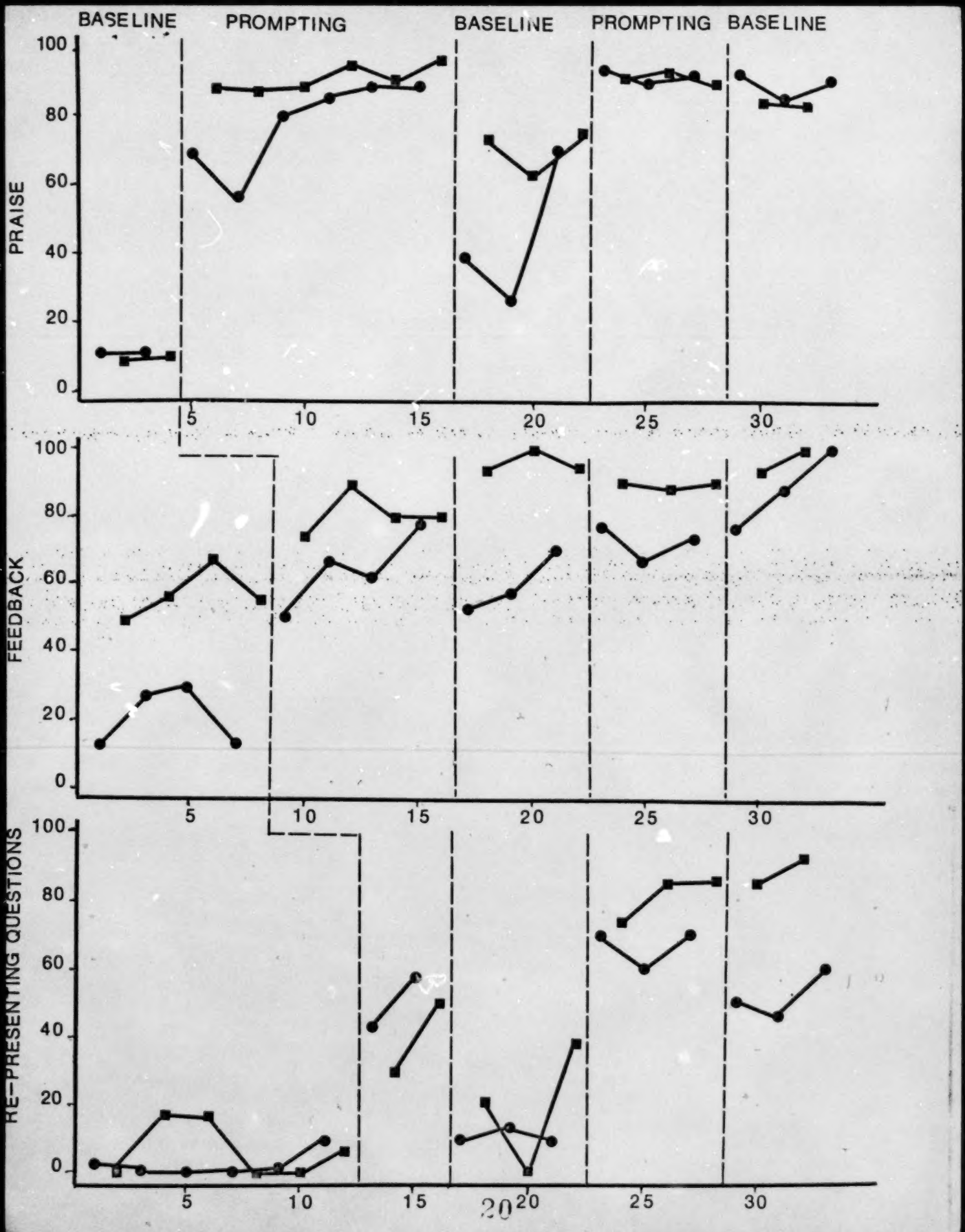
Figure Caption

Figure 1. Percent of unprompted praise, feedback, and re-presenting the question across experimental phases.

Reading Units

Arithmetic Units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